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Two-part drug capsule for use in powder inhalers is formed from hydrophobic plastics, preferably high density polyethylenePatent Assignee: BOEHRINGER INGELHEIM PHARMA KG (BOEH); ECKERT J (ECKE-I)
; HOCHRAINER D (HOCH-I)

Inventor: ECKERT J; HOCHRAINER D

Number of Countries: 052 Number of Patents: 014

Patent Family:

| Patent No | Kind | Date | Applicat No | Kind | Date | Week |
|----------------|------|----------|---------------|------|----------|----------|
| DE 19835346 | A1 | 20000210 | DE 1035346 | A | 19980805 | 200018 B |
| WO 200007572 | A2 | 20000217 | WO 99EP5614 | A | 19990803 | 200018 |
| AU 9957304 | A | 20000228 | AU 9957304 | A | 19990803 | 200030 |
| NO 200100535 | A | 20010131 | WO 99EP5614 | A | 19990803 | 200129 |
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Patent Details:

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BR 9912748 A A61K-009/48 Based on patent WO 200007572

EP 1100474 A2 G A61K-009/48 Based on patent WO 200007572

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US 20010008637 A1 A61K-009/48 Provisional application US 98113214

Cont of application US 99365912

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HU 200103490 A2 A61K-009/48 Based on patent WO 200007572
EP 1100474 B1 G A61K-009/48 Based on patent WO 200007572
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Abstract (Basic): DE 19835346 A1

NOVELTY - A capsule for pharmaceutical compositions for powder inhalers consists of a body and cap of the same material which fit together to form a stable, closed cavity of defined volume, and is of water-insoluble, hydrophobic plastics.

USE - Use of the capsule in powder inhalers is claimed, specifically for the administration of (i) cromoglycic acid, reproterol, beclomethasone, terbutaline, salbutamol, salmeterol, ketotifen, orciprenaline, flucatisone, ipratropium, dexamethasone, bambuterol, tiotropium, budesonide, fenoterol, clenbuterol, prednisolone, prednisone, prednylidene, methyl-prednisolone, formoterol or nedocromil (or their salts or mixtures), particularly ipratropium bromide or tiotropium bromide, (ii) other cortisone preparations or atropine derivatives suitable for inhalation or (iii) insulin.

ADVANTAGE - The capsules are easily adapted for use in powder inhalers, are easily inserted and located, are usable for long periods even in adverse climate zones (e.g. of high humidity), do not affect the pharmaceutical quality of the capsule contents and are easy to produce (e.g. by injection molding or blow molding). By using non-digestible plastics, the capsules do not release the contained drug if swallowed (e.g. by young children) and thus provide increased safety.

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Technology Focus:

TECHNOLOGY FOCUS - POLYMERS - Preferred Materials: The plastics is not digestible by humans; shows no significant adhesion to pharmaceutical chemicals; has a Shore D hardness of 65-73; and has a water vapor permeability of less than 1.5×10^{-14} (preferably $1.5 - 2 \times 10^{-16}$) kg/(m²s.Pa). The capsule resists a force of up to 15 N acting along its longitudinal axis and its transverse axis. The plastics is especially polyethylene having a density of 9500-10000 kg/m³, i.e. high density polyethylene.

Title Terms: TWO; PART; DRUG; CAPSULE; POWDER; INHALE; FORMING; HYDROPHOBIC ; PLASTICS; PREFER; HIGH; DENSITY; POLYETHYLENE

Derwent Class: A17; A23; A96; B05; B07; P33; P34

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International Patent Class (Additional): A61K-009/72; A61K-038/28;

A61M-015/00

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B12-M01B; B12-M11C

Chemical Fragment Codes (M1):

01 H7 H721 M210 M212 M320 M423 M431 M510 M520 M530 M540 M610 M782 M904
M905 M910 R012 R031 RA009Z-K RA009Z-M

Chemical Fragment Codes (M2):

04 D013 D019 D021 D029 D120 D199 H4 H401 H481 H5 H542 H8 J0 J012 J1
J112 J5 J522 M280 M313 M321 M332 M343 M383 M391 M412 M431 M512 M520
M530 M540 M782 M904 M905 R012 R031 R07193-K R07193-M

05 D011 D015 D932 G016 G100 H1 H102 H182 H2 H201 H212 H4 H403 H442 H481
H8 J5 J522 L9 L910 M210 M211 M273 M282 M312 M313 M321 M332 M342 M343

M373 M383 M391 M412 M431 M511 M520 M531 M540 M782 M904 M905 R012
R031 R06392-K R06392-M

06 G016 G100 H1 H102 H181 H4 H403 H442 H481 M210 M214 M233 M273 M281
M312 M321 M332 M343 M373 M391 M414 M431 M510 M520 M531 M540 M782
M904 M905 M910 R012 R031 R02026-K R02026-M R14963-K R14963-M

07 G015 G100 H1 H102 H181 H4 H403 H441 H482 H8 M210 M214 M233 M273 M281
M311 M312 M321 M332 M342 M343 M373 M392 M414 M431 M510 M520 M531
M540 M782 M904 M905 M910 R012 R031 R02007-K R02007-M R06679-K
R06679-M

08 G010 G015 G100 H1 H102 H181 H4 H403 H441 H482 H5 H581 H8 M280 M311
M312 M314 M315 M321 M332 M342 M343 M373 M383 M391 M393 M414 M431
M510 M520 M532 M540 M782 M904 M905 R012 R031 R16589-K R16589-M
R18850-K R18850-M

09 D023 D420 F011 F014 F433 H1 H181 H2 H201 H7 H720 J5 J561 M1 M116
M210 M211 M273 M281 M320 M412 M431 M511 M521 M530 M540 M782 M904
M905 R012 R031 R04289-K R04289-M R04523-K R04523-M 40256

10 G016 G100 H1 H102 H181 H4 H403 H442 H481 H8 M210 M213 M232 M273 M281
M312 M321 M332 M343 M373 M391 M414 M431 M510 M520 M531 M540 M782
M904 M905 M910 R012 R031 R01393-K R01393-M R06678-K R06678-M 40256

11 D011 D013 D016 D670 G010 G100 H1 H181 H2 H201 H4 H401 H481 H8 J0
J011 J2 J221 K0 L7 L721 M210 M211 M213 M232 M273 M282 M312 M321 M332
M343 M371 M391 M412 M431 M511 M520 M531 M540 M640 M650 M782 M904
M905 R012 R031 R06394-K R06394-M 40256

12 G016 G100 H1 H102 H181 H4 H401 H481 H8 K0 L4 L463 L499 M210 M211
M214 M233 M273 M283 M312 M321 M332 M343 M373 M391 M414 M431 M510
M520 M531 M540 M782 M904 M905 R012 R031 R21744-K R21744-M 40256

13 G013 G016 G100 H1 H102 H181 H4 H404 H443 H481 H8 M280 M312 M313 M321
M331 M332 M342 M343 M373 M392 M414 M431 M510 M520 M532 M540 M782
M904 M905 M910 R012 R031 R01962-K R01962-M R15573-K R15573-M 40256

14 G017 G100 H1 H102 H181 H4 H401 H481 H6 H602 H608 H642 H8 M210 M214
M233 M273 M281 M312 M321 M332 M343 M373 M391 M414 M431 M510 M520
M531 M540 M782 M904 M905 R012 R031 R10191-K R10191-M R15575-K
R15575-M 40256

15 G013 G015 G100 H1 H102 H181 H4 H402 H441 H481 H5 H541 H8 J0 J011 J3
J341 M210 M211 M272 M281 M312 M313 M321 M331 M332 M342 M343 M373
M392 M414 M431 M510 M520 M532 M540 M782 M904 M905 R012 R031 R06643-K
R06643-M R06644-K R06644-M 40256

16 D013 D014 D021 E520 H1 H181 H2 H201 J0 J012 J1 J112 J5 J522 M210
M212 M213 M240 M273 M281 M320 M412 M431 M511 M520 M530 M540 M782
M904 M905 R012 R031 R11659-K R11659-M R11961-K R11961-M 40256 03504

17 C035 C100 C720 D011 D013 D016 D670 G010 G100 H1 H181 H4 H401 H481 H8
J0 J011 J2 J221 K0 L7 L721 M210 M211 M213 M232 M273 M282 M312 M321
M332 M343 M371 M391 M411 M431 M511 M520 M531 M540 M782 M904 M905
R012 R031 R07935-K R07935-M 40256 03504

18 M431 M782 M904 M905 M910 R012 R031 R00002-K R00002-M R14648-K
R14648-M 40256 03504

Chemical Fragment Codes (M5):

19 M431 M782 M904 M905 R012 R031 R06391-K R06391-M 40256 03504 05595

20 M431 M782 M904 M905 M910 R012 R031 R00012-K R00012-M R14647-K
R14647-M 40256 03504 05595

21 M431 M782 M904 M905 R012 R031 RA1HEM-K RA1HEM-M 40256 03504 05595

22 C035 C100 C720 C800 C801 C803 C804 C805 C806 C807 D011 D013 D016
D030 E500 F012 F019 F211 F299 H1 H181 H4 H401 H481 H8 J0 J011 J2
J221 K0 L7 L721 M1 M126 M132 M210 M211 M273 M282 M311 M321 M344 M349
M371 M391 M411 M431 M511 M522 M530 M540 M640 M782 M904 M905 R012
R031 RA1HES-K RA1HES-M 40256 03504 05595 70264

23 M431 M782 M904 M905 M910 R012 R031 R00067-K R00067-M 40256 03504
05595 70264

24 M431 M782 M904 M905 R012 R031 R01629-K R01629-M RA08OH-K RA08OH-M
40256 03504 05595 70264

Chemical Fragment Codes (M6):

25 M905 R012 R031 R111 R440 40256 03504 05595 70264

Polymer Indexing (PS):

<01>

001 018; R00326 G0044 G0033 G0022 D01 D02 D12 D10 D51 D53 D58 D82;
R00964 G0044 G0033 G0022 D01 D02 D12 D10 D51 D53 D58 D83; H0000;
P1150 ; P1161 ; P1343

Ring Index Numbers: ; 40256; 40256; 03504; 03504; 05595; 70264

Derwent Registry Numbers: 0002-U; 0012-U; 0067-U; 1393-U; 1629-U; 1962-U;
2007-U; 2026-U; 2038-U

Specific Compound Numbers: RA009Z-K; RA009Z-M

Key Word Indexing Terms:

01 104401-0-0-0-CL 104471-0-0-0-CL 114603-0-0-0-CL 91813-0-0-0-CL
105475-0-0-0-CL 108527-0-0-0-CL 106444-0-0-0-CL 106472-0-0-0-CL
98656-0-0-0-CL 102795-0-0-0-CL 130424-0-0-0-CL 88344-0-0-0-CL
95027-0-0-0-CL 91220-0-0-0-CL 95529-1-0-0-CL 101750-0-0-0-CL
98110-0-0-0-CL 111078-1-0-0-CL 88520-1-0-0-CL 88752-2-0-0-CL
89459-1-0-0-CL 104616-1-0-0-CL 104629-1-0-0-CL 104636-1-0-0-CL

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